Amendments to the Claims

This listing of the claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A device for releasing a latch comprising:

a housing having a recessed region and a tubular mount extending from the center of the recessed region;

an electric motor mounted in the housing;

a worm operatively coupled to the motor for driving rotation of the worm about an axis in a first rotational direction;

a worm gear, in meshing engagement with the worm and rotatably mounted to the tubular mount, and being mounted in the housing for rotation about an axis substantially orthogonal to the worm axis;

a camshaft mounted on the worm gear and having a rotation axis coincident with the gear axis, the camshaft having a distal end extending to the exterior of the housing;

a cam affixed at the exterior end of the camshaft, having a surface for engaging the latch to move the latch from a closed position to a release position as the gear rotates in a first direction from a first position to a second position under control of the motor; and

wherein the worm gear is biased against the rotation from the first position to the second position by a spring connected between the gear and the housing such that energy is transferred from the motor to the spring as the gear rotates from said first position to said second position under control of the motor and, when the motor is powered down, the energy stored in the spring causes the gear to rotate in a second direction, opposite to the first direction, from the second position to the first position.

2. (Canceled)

3. (Canceled)

4. (Previously presented) The device of claim 1, wherein the tubular mount includes an open end facing towards the worm gear, and the worm gear includes a shaft extending into the open end, and an outer rim spaced from the shaft by a gear wall.

5. (Previously presented) The device of claim 4, wherein the spring is a helical spring located between the tubular mount and the rim on the worm gear.

6. (Previously presented) The device of claim 4, wherein the housing includes a first stop and a second stop unitarily molded therewith, and the gear includes a first stop and a second stop, wherein when the gear is in the first position, the first stops are in mutual abutment to preclude rotation in the second direction, and when the gear is in the second position, the second stops are in mutual abutment to preclude rotation in the first direction.

7. (Original) The device of claim 6, wherein the device further comprises an injection-molded closure plate, and the housing includes a hollow portion and the housing and plate have opposing walls shaped to abut a housing of the motor when the hollow portion and the plate are secured together, and the plate further includes protrusions which extend into the housing interior to abut sides of the motor housing to preclude movement therepast.

8. (Original) The device of claim 7, wherein the hollow portion includes an upstanding peripheral ridge unitarily molded therewith, and shaped to abut an inner surface of the plate, and the plate of the housing includes an upstanding peripheral ridge unitarily molded therewith and shaped to abut an inner surface of the housing, to protect against the egress of water into the interior of the housing, and wherein the ridges are located to provide a water flow path around the outer periphery thereof.

9. (Canceled)

10. (Previously presented) The device of claim 8, wherein the housing plate includes an aperture in communication with the central aperture of the gear, to permit passage of

the camshaft therethrough, and wherein the distal end of the camshaft includes at least one resilient finger received through the communicating apertures and having a surface in abutting contact with an opposing surface of the gear to preclude axial withdrawal of the camshaft from the gear aperture.

11. (Previously presented) The device of claim 10, wherein said cam surface for engaging the latch is oriented to move the latch in a direction having a vectorial component non-parallel to the direction of rotation of the gear shaft as the gear [[wheel]] rotates in said first direction.

12. (Original) The device of claim 7, further comprising electrically conductive contacts embedded into the housing as the housing is molded, in electrical contact with the motor, and extending to the exterior of the housing for connection to an electric power supply.

13. (Original) The device of claim 7, wherein the housing and the closure plate include a plurality of holes in communication with each other and located to permit simultaneous fastening of the housing and closure plate together and fastening of the device adjacent said latch with the cam in operable proximity thereto.

14. (Canceled)

15. (Previously presented) The device of claim 1, wherein the camshaft depends from a center point of the cam so that when the cam is mounted to the worm gear, the two are coaxial.

16. (Previously presented) The device of claim 10, wherein the at least one resilient finger includes a tab extending out radially from the axis of the camshaft, and the tab provides the surface in abutting contact with the surface of the gear that faces away from the cam.

17. (Previously presented) The device of claim 16, wherein the at least one resilient finger includes at least two resilient fingers spaced apart from each other on opposing sides of the central axis of the camshaft.

18. (Previously presented) The device of claim 17, wherein the tab includes a chamfered surface to facilitate entry of the resilient finger into the aperture.

19. (Previously presented) The device of claim 18, wherein the tabs on the at least two resilient fingers squeeze together when entering the aperture, and then return to their spaced position outside the aperture so that the tabs provide the surface in abutting contact with the surface of the gear that faces away from the cam.

20. (Previously presented) The device of claim 24, wherein a cross-section of the cam shaft and the aperture are noncircular, the cross-sections of the camshaft and the aperture orienting the cam for operation between the open and the closed positions.

21. (Previously presented) The device of claim 6, wherein the worm gear includes a catch for retaining a first end of the spring.

22. (Previously presented) The device of claim 21, wherein the catch includes an overhanging portion operable to retain the spring during the assembly of the latch release device.

23. (Previously presented) The device of claim 21, wherein one of the first and second stops formed in the housing is adapted to retain a second end of the spring.

24. (Previously presented) A device for releasing a latch comprising:

a housing;

an electric motor mounted in the housing;

a worm operatively coupled to the motor for driving rotation of the worm about an axis in a first rotational direction;

a worm gear, in meshing engagement with the worm, and being mounted in the

housing for rotation about an axis substantially orthogonal to the worm axis;

a camshaft mounted on the worm gear and having a rotation axis coincident with the gear axis, the camshaft having a distal end extending to the exterior of the housing;

a cam affixed at the exterior end of the camshaft, having a surface for engaging the latch to move the latch from a closed position to a release position as the gear rotates in a first direction from a first position to a second position under control of the motor; and

a spring connected between the gear and the housing so as to bias the worm gear against rotation from the first position to the second position and such that energy is transferred from the motor to the spring as the gear rotates from said first position to said second position under control of the motor and, when the motor is powered down, the energy stored in the spring causes the gear to rotate in a second direction, opposite to the first direction, from the second position to the first position.

25. (Previously presented) The device of claim 24, wherein the worm gear comprises a shaft rotatably mounted to the housing, and an outer rim spaced from the shaft, the rim bearing teeth in said meshing engagement with the worm, and said spring is a helical spring located between the shaft and the rim.

26. (Previously presented) The device of claim 24, wherein the housing comprises an injection-molded plastic tubular mount extending into the housing interior, with the gear being rotatably mounted thereon.

27. (Previously presented) The device of claim 26, wherein the housing includes a first stop and a second stop unitarily molded therewith, and the gear includes a first stop and a second stop, wherein when the gear is in the first position, the first stops are in mutual abutment to preclude rotation in the second direction, and when the gear is in the second position, the second stops are in mutual abutment to preclude rotation in the first direction.

28. (Previously presented) The device of claim 27, wherein the device further comprises an injection-molded closure plate, and the housing includes a hollow portion and the housing and plate have opposing walls shaped to abut a housing of the motor when the hollow portion and the plate are secured together, and the plate further includes protrusions which extend into the housing interior to abut sides of the motor housing to preclude movement therepast.

29. (Previously presented) The device of claim 28, wherein the hollow portion includes an upstanding peripheral ridge unitarily molded therewith, and shaped to abut an inner surface of the plate, and the plate of the housing includes an upstanding peripheral ridge unitarily molded therewith and shaped to abut an inner surface of the housing, to protect against the egress of water into the interior of the housing, and wherein the ridges are located to provide a water flow path around the outer periphery thereof.

30. (Previously presented) The device of claim 29, wherein the tubular mount of the housing has an open end and the gear is rotatably mounted therein by means of a shaft extending from the gear that is received in said open end, the gear including a rim spaced from the shaft, and the spring is located between the rim and the tubular mount of the housing.

31. (Previously presented) The device of claim 30, wherein the housing plate includes an aperture in communication with the central aperture of the gear, to permit passage of the camshaft therethrough, and wherein the distal end of the camshaft includes at least one resilient finger received through the communicating apertures and having a surface in abutting contact with an opposing surface of the gear to preclude axial withdrawal of the camshaft from the gear aperture.

32. (Previously presented) The device of claim 31, wherein said cam surface for engaging the latch is oriented to move the latch in a direction having a vectorial component non-parallel to the direction of rotation of the gear shaft as the gear rotates in said first direction.

33. (Previously presented) The device of claim 28, further comprising electrically conductive contacts embedded into the housing as the housing is molded, in electrical contact with the motor, and extending to the exterior of the housing for connection to an electric power supply.

34. (Previously presented) The device of claim 28, wherein the housing and the closure plate include a plurality of holes in communication with each other and located to permit simultaneous fastening of the housing and closure plate together and fastening of the device adjacent said latch with the cam in operable proximity thereto.

35. (Currently amended) The device of claim 5 [[1]], wherein the worm, the worm gear and the spring are located within the housing.

36. (Previously presented) The device of claim 24, wherein the worm, the worm gear and the spring are located within the housing.

37. (Previously presented) The device of claim 35, wherein the spring is a helical spring located between the tubular mount and the rim on the worm gear.

38. (Previously presented) The device of claim 36, wherein the housing is injected-molded and includes a first stop and a second stop unitarily molded therewith, and the gear includes a first stop and a second stop, wherein when the gear is in the first position, the first stops are in mutual abutment to preclude rotation in the second direction, and when the gear is in the second position, the second stops are in mutual abutment to preclude rotation in the first direction.

39. (Previously presented) The device of claim 38, wherein the device further comprises an injection-molded closure plate, and the housing includes a hollow portion and the housing and plate have opposing walls shaped to abut a housing of the motor when the hollow portion and the plate are secured together, and the plate further includes protrusions which extend into the housing interior to abut sides of the motor housing to preclude movement therepast.

40. (Previously presented) The device of claim 39, wherein the housing plate includes an aperture in communication with the central aperture of the gear, to permit passage of the camshaft therethrough, and wherein the distal end of the camshaft includes at least one resilient finger received through the communicating apertures and having a surface in abutting contact with an opposing surface of the gear to preclude axial withdrawal of the camshaft from the gear aperture.

41. (Previously presented) The device of claim 40, wherein the at least one resilient finger includes a tab extending out radially from the axis of the camshaft, and the tab provides the surface in abutting contact with the surface of the gear that faces away from the cam.

42. (Previously presented) The device of claim 41, wherein the tab includes a chamfered surface to facilitate entry of the resilient finger into the aperture.

43. (Previously presented) The device of claim 38, wherein the worm gear includes a catch for retaining a first end of the spring.

44. (Previously presented) The device of claim 43, wherein one of the first and second stops formed in the housing is adapted to retain a second end of the spring.